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## 2.0 SUMMARY OF THE ALTERNATIVES

As described in Chapter 1, NMFS is considering various shark management measures to meet the objectives of the Magnuson-Stevens Act and the Consolidated HMS FMP based on the 2006 stock assessments for Large Coastal Sharks (LCS), sandbar sharks, blacktip sharks, dusky sharks, and porbeagle sharks. NMFS produced a Pre-Draft of Amendment 2 to the Consolidated HMS FMP (pre-draft) which was presented to the HMS Advisory Panel (AP) in early March 2007, at which time NMFS asked for written comments. The Notice of Availability for the draft Amendment 2 to the Consolidated Atlantic Highly Migratory Species (HMS) Fishery Management Plan (FMP) and the proposed rule were published in the Federal Register on July 27, 2007 (72 FR 41324 and 41392, respectively). The draft amendment included the Draft Environmental Impact Statement (DEIS). The pre-draft, summaries of the March 2007 AP meeting and copies of the written comments received, as well as the DEIS and proposed rule are available upon request. This section provides a description and basis for all alternatives considered in Amendment 2 to the Consolidated HMS FMP, including the consideration of public comment. The ecological, economic, and social impacts of these alternatives are discussed in later chapters.

NMFS has grouped the potential management measures into seven key topics:

- 1) Quotas/Species complexes;
- 2) Time/Area closures;
- 3) Commercial retention limits;
- 4) Reporting requirements;
- 5) Seasons;
- 6) Regions; and,
- 7) Recreational management measures.

Traditionally, NMFS has analyzed various alternatives under each of these key topics separately for the Atlantic shark fishery. For example, under Quotas/Species Complexes, NMFS could analyze a range of quota alternatives specific to that key topic from no fishing (*i.e.* a quota of zero with all species prohibited) to status quo (SQ) (*i.e.* a quota of 1,017 mt dw with 19 species prohibited), and so forth, for each of the key topics.

Analyzing these different alternatives separately may add to public confusion since it may not be obvious what the ramifications of selecting different alternatives within a key topic may be on the shark stocks and participants in the shark fishery in aggregate. Using the alternative suite approach, it is clearer to a directed shark permit holder for example, the ramifications of a suite of alternatives that contain measures concerning quotas, retention limits, reporting, etc. Additionally, listing and analyzing the topics separately may not reinforce why NMFS chose particular preferred alternatives across the different topics. Given the specific objectives of this rulemaking (including rebuilding overfished shark stocks and ending overfishing), only certain combinations of alternatives under the different key topics will meet the management goals. For example, to rebuild overfished shark stocks it is necessary to implement a quota consistent with the rebuilding plan, reduced retention limits that would ensure

that the quota is not achieved too quickly, and increase reporting frequency to improve the likelihood that the smaller quota for rebuilding is not exceeded.

NMFS intends for this method of analyzing alternative suites that contain measures for the key topics:

- To capture the entire range of potential environmental and socioeconomic impacts and better describe the relationship between the different alternatives;
- To provide a clearer representation of the impacts of the alternatives and why an alternative suite is considered or preferred;
- To reduce the number of permutations or combinations of alternatives that may be combined, and which could be at odds with one another;
- To provide fishermen with a better understanding of how a particular alternative suite would affect them based on the permit(s) they possess;
- To elucidate the viable combination of management measures that will rebuild several shark stocks and end overfishing; and,
- To clarify the approach being used to reach the management goals outlined in this rulemaking (*i.e.*, outline how the total allowable catch for sandbar sharks is being attained while allowing retention of other shark species).

The alternative suites are described below and in Table 2.1.

## **2.1 Description of Alternative Suites**

Five alternative suites were developed, each proposing a specific combination of the seven key topics. The same alternative suite that was preferred in the DEIS remains preferred in the final EIS (FEIS) (alternative suite 4). However, based on public comments, several aspects of the management measures in alternative suite 4 have been modified between the DEIS and FEIS. These changes are described in detail in Chapter 4 and Appendix C, and a detailed discussion of public comments and Agency responses is provided in Appendix D.

In addition to the five alternative suites, the proposed action also included two administrative topics, one related to the timing of stock assessments and the other to the timing of SAFE reports. Two alternatives (alternative 6 and 7) for the timing of stock assessments are analyzed and two alternatives for the timing of Stock Assessment and Fishery Evaluation Report (SAFE) (numbered 8 and 9) are analyzed. Alternative 7 regarding the timing of stock assessments and alternative 9 regarding the timing of the SAFE reports have been identified as the preferred alternatives in the FEIS. Thus, the complete action under consideration comprise one alternative suite selected from suites 1 through 5 (Sections 4.1 through 4.5), plus alternative 6 or 7 (Sections 4.6 and 4.7), and alternative 8 or 9 (Sections 4.8 and 4.9). In addition to alternative suite 4, NMFS identifies alternative 7 regarding the timing of stock assessments and alternative 9 regarding the timing of SAFE reports as the preferred alternatives in the FEIS. These alternatives were also preferred in the DEIS.

### **2.1.1 Alternative Suite 1: Maintaining the Existing Atlantic Commercial and Recreational Shark Fisheries (Status Quo)**

The status quo alternative suite would maintain the existing commercial and recreational management measures for the Atlantic LCS, Small Coastal Sharks (SCS), and pelagic shark fisheries as established in the Consolidated Atlantic HMS FMP. The seventy-two species of Atlantic sharks managed by NMFS are divided into four species groups for management: LCS, SCS, pelagic sharks, and prohibited sharks. The LCS complex is comprised of 11 species including sandbar, silky, tiger, blacktip, spinner, bull, lemon, nurse, scalloped hammerhead, great hammerhead, and smooth hammerhead sharks. SCS consist of finetooth, Atlantic sharpnose, blacknose, and bonnethead sharks. Pelagic sharks consist of blue, oceanic whitetip, porbeagle, shortfin mako, and common thresher sharks. Prohibited sharks consist of sand tiger, bigeye sand tiger, whale, basking, white, dusky, bignose, Galapagos, night, Caribbean reef, smalltail, Caribbean sharpnose, narrowtooth, Atlantic angel, longfin mako, bigeye thresher, sevengill, sixgill, and bigeye sixgill sharks. The remaining 33 species are included for data collection purposes only.

Specific management measures currently in place include:

#### *Commercial Management Measures*

##### Quotas/Species Complexes:

- Base quota: LCS Complex (11 species, includes sandbar sharks) = 1,017 mt dw; SCS complex = 454 mt dw; Pelagic Sharks (Other than Blue and Porbeagle Sharks) = 488 mt dw; Blue Sharks = 273 mt dw; Porbeagle Sharks = 92 mt dw; and Display and Scientific Research = 60 mt ww;
- Process for adjusted quota: Overharvests and underharvests are deducted from/added to the next years corresponding regional trimester quota;

##### Time/Area Closures:

- Mid-Atlantic Shark Closed Area and Caribbean Sustainable Fisheries Act (SFA) closures are seasonal bottom longline (BLL) closures; the Atlantic Large Whale Take Reduction Plan (ALWTRP) has implemented a suite of gear restrictions, observer requirements, etc. to reduce the likelihood of interactions between shark gillnet (GN) gear and endangered north Atlantic right whales during the winter calving period. Several pelagic longline (PLL) time/area closures apply if shark permit holders are using this gear;

##### Retention Limits:

- LCS: 4,000 lb dw for directed permit holders and 5 LCS for incidental permit holders;
- SCS: No retention limit for directed permit holders and 16 SCS and pelagic sharks combined for incidental permit holders;
- Pelagic Sharks: No retention limit for directed permit holders and 16 SCS and pelagic sharks combined for incidental permit holders;

- Fishermen may land sharks with fins removed except for the anal and 2<sup>nd</sup> dorsal fins. The total quantity of fins may not exceed 5 percent of the total dressed carcass weight of sharks on board;

#### Reporting:

- Dealer reports must be *postmarked* by the dealer within 10 days of the 1<sup>st</sup> and 15<sup>th</sup> of every month;
- Logbooks (Coastal Fisheries or HMS Logbook) must be submitted by fishermen within seven days of offloading any sharks;
- Mandatory vessel observer coverage if selected;

#### Seasons:

- Three trimesters (January – April; May – August; and, September – December) for LCS, SCS, and pelagic sharks;
- Seasons are established based on quota availability, catch rates, and public comment. LCS opening and closing dates are announced prior to season opening. Pelagic and SCS sharks closed, as needed, with 14-day notice; and,

#### Regions:

- Three regions (Gulf of Mexico, South Atlantic, and North Atlantic) for SCS and LCS; no regions for pelagic sharks.

#### *Recreational Management Measures*

- Authorized species include LCS: blacktip, spinner, bull, nurse, tiger, lemon, great hammerhead, smooth hammerhead, scalloped hammerhead, silky, and sandbar; SCS: bonnethead, Atlantic sharpnose, finetooth, and blacknose sharks; Pelagics: porbeagle, shortfin mako, common thresher, oceanic whitetip, and blue sharks; and,
- Possession limit: 1 shark > 54” fork length (FL) per vessel per trip, also 1 sharpnose and 1 bonnethead per person per trip with no minimum size requirements.

#### **2.1.2 Alternative Suite 2: Shark Fishery for Directed, HMS Angling, and HMS Charter/Headboat Permit Holders Only**

Alternative suite 2 would allow only directed shark permit holders to commercially harvest sharks, but would prohibit retention of sandbar sharks on PLL gear. Incidental permit holders would not be allowed to retain any shark species. Porbeagle sharks would be placed on the prohibited list in alternative suites 2 through 3 and 5, resulting in no retention of porbeagle sharks by commercial or recreational fishermen. Species complexes, commercial quotas, and commercial retention limits for alternative suites 2-4 are described in Appendix A. Recreational bag limits would stay the same as the status quo for alternative suites 2 through 5; however, only the species listed in Table 2.1 would be allowed to be retained by recreational fishermen (*i.e.*, those that possess a HMS Angling, HMS Charter/Headboat, or Atlantic tunas General Category permit if participating in a registered HMS tournament). This list of authorized species is based

on species of shark that recreational fishermen could easily identify to reduce fishing pressure as a result of mis-identification on dusky, sandbar, and porbeagle sharks.

Dusky sharks would not be authorized for collection for public display under alternative suites 2 through 5. However, based on research needs and objectives, NMFS would review the allocation of dusky sharks for research on a case-by-case basis and subtract these allocations from the research and display quota. NMFS would allocate 1 mt dw (1.39 mt ww) of the status quo 60 mt ww (43.2 mt dw) display and research set-aside to sandbar sharks for public display. An additional 1 mt dw (1.39 mt ww) of the sandbar sharks would be allocated specifically for research conducted by industry vessels (however, this would be separate from any sandbar quota used in the research fishery in the preferred alternative suite 4). The remaining research and display set-aside (41.2 mt dw or 57.2 mt ww) would be authorized for all other shark species, excluding dusky and sandbar sharks, under the exempted fishing program. These new allocations would apply to alternative suites 2 through 5.

Specific management measures implemented via this alternative suite would include:

#### *Commercial Management Measures*

##### Quotas/Species Complexes:

- Base quota: Sandbar = 116.6 mt dw; non-sandbar LCS = 541.2 mt dw; SCS = 454 mt dw; Pelagic Sharks (Other than Blue and Porbeagle Sharks) = 488 mt dw; Blue Sharks = 273 mt dw; Porbeagle Sharks = Prohibited (0 mt dw quota); and Display and Scientific Research = 60 mt ww (Sandbar = 2.8 mt ww (2 mt dw); all other shark species (except dusky sharks) = 57.2 mt ww (41.2 mt dw);
- Adjusted quota process: Overharvests would be removed from the next season's quota in their entirety. Underharvests for species whose status is not unknown, overfished, or experiencing overfishing would be transferred to the next season's quota, up to 50 percent of the base quota. For species/complexes whose status is overfished, experiencing overfishing, or unknown, underharvests would not be transferred to the next season's quota;

##### Time/Area Closures:

- Maintain status quo mid-Atlantic shark closed area closure; close the eight marine protected areas (MPAs) listed in the South Atlantic Fishery Management Council's (SAFMC) Amendment 14;

##### Retention Limits:

- 8 sandbar/vessel/trip and 21 non-sandbar LCS/vessel/trip for directed permit holders only; no trip limit for SCS and pelagic sharks for directed permit holders;
- No retention of any sharks by incidental permit holders;
- No sandbar sharks retained with PLL onboard;
- Retention of porbeagle sharks would be prohibited in all fisheries;
- All sharks must be landed with all fins naturally attached;

### Reporting:

- Dealer reports must be *received* by NMFS within 24 hours of sale of shark;
- Logbook and vessel observer requirements would be maintained and not modified;
- All unclassified sharks reported would be categorized as sandbar sharks;

### Seasons:

- One commercial season opening on January 1 of each year;
- Close seasons for sandbar and non-sandbar LCS when landings of either reach 80% of the available quota with a five day notice;
- SCS and pelagic sharks would continue to be retained until SCS and pelagic shark landings reach 80% of their respective quotas; and,

### Regions:

- One region for all managed shark species.

### *Recreational Management Measures*

- Authorized species include LCS: nurse, tiger, lemon, great hammerhead, smooth hammerhead, and scalloped hammerhead; SCS: bonnethead and Atlantic sharpnose; Pelagics: shortfin mako, common thresher, oceanic whitetip, and blue sharks; and,
- Possession limit: 1 shark > 54" FL per vessel per trip, also 1 sharpnose and 1 bonnethead per person per trip with no minimum size requirements.

#### **2.1.3 Alternative Suite 3: Shark Fishery for Directed, Incidental, HMS Angling, and HMS Charter/Headboat Permit Holders**

Alternative suite 3 would implement management measures resulting in a reduced shark fishery for sandbar sharks and non-sandbar LCS by incidental and directed shark permit holders. Incidental and directed shark permit holders would also be allowed to land SCS and pelagic sharks (except porbeagle sharks). Recreational fishermen (*i.e.*, those that possess a HMS Angling, HMS Charter/Headboat, or Atlantic tunas General Category permit if participating in a registered HMS tournament) would be allowed to retain species of sharks that are easy to identify (see Table 2.1). Unlike alternative suite 2, this alternative would allow incidental shark permit holders to retain some sharks. Species complexes, commercial quotas, and commercial retention limits for this alternative suite are described in Appendix A.

Specific management measures implemented via this alternative would include:

### *Commercial Management Measures*

#### Quotas/Species Complexes:

- Base quotas: Sandbar = 116.6 mt dw; non-sandbar LCS = 541.2 mt dw; SCS = 454 mt dw; Pelagic Sharks (Other than Blue and Porbeagle Sharks) = 488 mt dw; Blue Sharks = 273 mt dw; Porbeagle Sharks = Prohibited (0 mt dw quota); and Display and Scientific



Research = 60 mt ww (Sandbar = 2.8 mt ww (2 mt dw)); all other shark species (except dusky sharks) = 57.2 mt ww (41.2 mt dw);

- Adjusted quota process: Overharvests would be removed directly from the next season's quota in their entirety. Underharvests for species whose status is not unknown, overfished, or experiencing overfishing would be transferred to the next season's quota, up to 50 percent of the base quota. For species/complexes whose status is overfished, unknown, or experiencing overfishing, underharvests would not be transferred to the next season's quota;

#### Time/Area Closures:

- Maintain existing time area closures and close the eight time/area closures recommended by the SAFMC in their Amendment 14;

#### Retention Limits:

- 4 sandbar/vessel/trip and 10 non-sandbar LCS/vessel/trip for directed and incidental permit holders;
- No retention limit for SCS and pelagic sharks for directed permit holders;
- 16 SCS and pelagic sharks/vessel/trip (combined) for incidental permit holders;
- Retention of porbeagle sharks would be prohibited in all fisheries;
- All sharks must be landed with all fins naturally attached;
- All gears allowed (no restrictions for PLL);

#### Reporting:

- Dealer reports must be *received* by NMFS no later than 10 days after each reporting period (*i.e.*, 25<sup>th</sup> and 10<sup>th</sup> of each month);
- Logbook and vessel observer requirements would remain status quo;
- All unclassified sharks reported would be categorized as sandbar sharks;

#### Seasons:

- One commercial season opening on January 1 of each year;
- Close seasons for sandbar and non-sandbar LCS when landings of either reach 80% of the available quota with a five day notice;
- SCS and pelagic sharks could continue to be retained until SCS and pelagic shark landings reach 80% of their respective quotas; and,

#### Regions:

- One region for all managed shark species.

## *Recreational Management Measures*

- Authorized species include LCS: nurse, tiger, lemon, great hammerhead, smooth hammerhead, and scalloped hammerhead; SCS: bonnethead and Atlantic sharpnose; pelagic: shortfin mako, common thresher, oceanic whitetip, and blue sharks; and,
- Possession limit: 1 shark > 54" FL per vessel per trip, also 1 sharpnose and 1 bonnethead per person per trip with no minimum size requirements.

### ***2.1.4 Alternative Suite 4: Establish a Research Fishery for Sandbar Sharks; Shark Fishery for Directed, Incidental, HMS Angling, and HMS Charter/Headboat Permit Holders – Preferred Alternative***

Alternative suite 4 would establish a small research fishery that would harvest the entire available sandbar quota on an annual basis. Vessels inside the research fishery could also retain non-sandbar LCS, SCS, and pelagic sharks. Vessels with commercial shark permits outside of the research fishery could only retain non-sandbar LCS as well as SCS and pelagic sharks (see Table 2.1). Vessel participation in the research fishery would be conditioned on vessels meeting specific criteria designed to meet research objectives while allowing fishermen to earn revenue from selling sandbar and other sharks that are caught under the purview of this fishery. These criteria may include, but are not limited to: possession of a commercial shark permit, seasonal flexibility with regard to trips targeting sandbar sharks, willingness and ability to take an observer on 100 percent of fishing trips and collect biological samples from landed and released sharks, and ability to participate in the program for at least one year. Vessels not participating in the research program would still be authorized to land non-sandbar LCS, SCS, and pelagic sharks subject to the retention limits described below. Species complexes, commercial quotas, and commercial retention limits for this alternative suite are described in Appendix A and Appendix C. Only vessels participating in the research fishery could land sandbar sharks.

The Agency is preferring incorporation of the shark research fishery into the existing program for issuance of Exempted Fishing Permits, Display Permits, Scientific Research Permits, and Letters of Acknowledgement. NMFS would publish a request for proposals in the Federal Register and would invite permit holders to submit an application to participate in the shark research fishery on an annual basis. Applications would be evaluated based on several criteria, examples of which may include: selected vessels are willing to take an observer and participate in data collection efforts on all trips under the purview of this permit, vessels are flexible with regard to timing of fishing excursions to ensure that samples are collected throughout the year, past compliance with observer program requirements, vessels are selected from all regions to ensure that samples are collected throughout the U.S. Atlantic and Gulf of Mexico consistent with research objectives, and if selected vessels have had any HMS fisheries violations for which they received a Notice of Violation Assessment (NOVA) or other significant violations in the past. Actual criteria would be further described in the annual Federal Register notice published to solicit applications for the shark research fishery. The Agency is interested in collecting biological samples from sandbar and non-sandbar LCS throughout the year, therefore, the Agency would determine when the research vessels would fish to ensure adequate spatial and temporal sampling throughout the year. The Agency would determine the number of vessels that may participate in the shark research fishery annually based on available quota and research objectives. Data collected from the shark research fishery would assist

fisheries scientists and managers in maintaining catch series data from the commercial shark fishery which is critical for future stock assessments. Shark life history data, including age at first maturity for sandbar sharks could also be improved as a result of this research fishery. Furthermore, research assessing methods to reduce interactions with dusky sharks, protected resources, or other bycatch may be investigated on vessels participating in this program.

Specific management measures implemented via this alternative would include:

#### *Commercial Management Measures*

##### Quotas/Species Complexes:

- Base quotas: Sandbar research quota = 116.6 mt dw; non-sandbar LCS research quota = 50 mt dw; Gulf of Mexico non-sandbar LCS = 439.5 mt dw; Atlantic non-sandbar LCS = 188.3 mt dw; SCS = 454 mt dw; Pelagic Sharks (Other than Blue and Porbeagle Sharks) = 488 mt dw; Blue Sharks = 273 mt dw; Porbeagle Sharks = 1.7 mt dw; and Display and Scientific Research = 60 mt ww (Sandbar = 2.8 mt ww (2 mt dw)); and all other shark species (except dusky sharks) = 57.2 mt ww (41.2 mt dw);
- Adjusted quota process: Overharvests would be removed from the next season's quota or over multiple years (*i.e.*, 5 years) depending on the level of overharvest. Underharvests for species whose status is not unknown, overfished, or experiencing overfishing would be transferred to the next season's quota, up to 50 percent of the base quota. For species/complexes whose status is overfished, unknown, or experiencing overfishing; underharvests would not be transferred to the next season's quota;
- NMFS would implement adjusted annual quotas for 5 years (through the end of 2012) for sandbar sharks and non-sandbar LCS based on overharvests of the LCS complex during 2007 (see Appendix C for more details). These adjusted quotas are as follows: Sandbar research quota = 87.9 mt dw; non-sandbar LCS research quota = 37.5 mt dw; Gulf of Mexico non-sandbar LCS = 390.5 mt dw; and Atlantic non-sandbar LCS = 187.8 mt dw. These quotas may be reduced further, if necessary, depending on future overharvests in the fishery;

##### Time/Area Closures:

- Maintain status quo time area closures and close the eight time/area closures recommended by the SAFMC;

##### Retention Limits:

- No sandbar sharks may be landed outside of the research program;
- Trip limit for sandbar and non-sandbar LCS (combined) for vessels participating in research program would vary depending on research criteria and data needs;
- Under the base non-sandbar LCS quota, 36 non-sandbar LCS/vessel/trip for directed permit holders and 3 non-sandbar LCS/vessel/trip for incidental permit holders outside the shark research program;

- Under the adjusted non-sandbar LCS quotas, 33 non-sandbar LCS/vessel/trip for directed permit holders and 3 non-sandbar LCS/vessel/trip for incidental permit holders (from 2008-2012; see above) outside the shark research program;
- No trip limit for SCS or pelagic sharks for directed permit holders; 16 SCS and pelagic sharks combined for incidental permit holders;
- All sharks must be landed with all fins naturally attached;

#### Reporting:

- Dealer reports must be *received* by NMFS no later than 10 days after each reporting period (*i.e.*, 25<sup>th</sup> and 10<sup>th</sup> of each month);
- 100 percent observer coverage for vessels participating in sandbar shark research program;
- Other logbook and vessel observer requirements would be maintained for vessels outside the research program;
- Landings from dealer reports and/or observer reports from outside the research fishery would be used to proportion unclassified sharks according to the sandbar, non-sandbar LCS, SCS, and pelagic shark quotas;

#### Seasons:

- One commercial season opening on January 1 of each year;
- Sandbar, non-sandbar LCS, SCS, and pelagic sharks would close with a five day notice when landings of each species/complex reach 80% of their respective quotas;
- NMFS would send out e-mail notices and other outreach materials to notify the public of the fishery closure when the notice files with the Federal Register. The fishery would close five days after the filing of the notice;

#### Regions:

- Non-sandbar LCS: Two regions: an Atlantic (South Atlantic and North Atlantic combined) and Gulf of Mexico region;
- Sandbar: One region;
- SCS: One region; and,
- Pelagic sharks: One region.

#### *Recreational Management Measures*

- Recreational fishermen could land tiger sharks and non-ridgeback LCS (blacktip, spinner, bull, lemon, nurse, great hammerhead, smooth hammerhead, and scalloped hammerhead sharks). In addition, they can land SCS (bonnethead, Atlantic sharpnose, finetooth and blacknose sharks), and Pelagic sharks (shortfin mako, common thresher, oceanic whitetip, blue, and porbeagle sharks). Recreational anglers would not be allowed to retain sandbar or silky sharks (and any other prohibited species); and,
- Possession limit: 1 >54" FL shark per vessel per trip, also 1 sharpnose and 1 bonnethead per person with no minimum size.

### **2.1.5 Alternative Suite 5: Close All Atlantic Shark Fisheries**

This alternative would close all Atlantic, Gulf of Mexico, and Caribbean shark fisheries for all fishermen until reopening is warranted based on new stock assessments. Since interactions with sharks would likely occur in other commercial fisheries (*e.g.*, snapper grouper, tilefish, mackerel), this alternative suite would modify the process of selection for discard reporting in the Coastal Fisheries Logbook to ensure that data on shark interactions in other non-HMS fisheries would be available. Shark landings would be limited to research and the collection for public display via the HMS Exempted Fishing Program. Recreational fisheries would be catch and release only.

Specific management measures implemented via this alternative would include:

#### *Commercial Management Measures*

##### Quotas/Species Complexes:

- Sandbar = 0 mt dw; non-sandbar LCS = 0 mt dw; SCS = 0 mt dw; Pelagic Sharks (Other than Blue and Porbeagle Sharks) = 0 mt dw; Blue Sharks = 0 mt dw; Porbeagle Sharks = Prohibited (0 mt dw quota); and Display and Scientific Research = 60 mt ww (Sandbar = 2.8 mt ww (2 mt dw); all other shark species (except dusky sharks) = 57.2 mt ww (41.2 mt dw);

##### Time/Area Closures:

- Time/Area closures for BLL gear for the commercial shark fishery would no longer be applicable since all retention of sharks would be prohibited;
- HMS time/area closures for other gear types and fisheries would still be in effect;

##### Retention Limits:

- No sharks of any species could be possessed in the Atlantic, Caribbean, and Gulf of Mexico;

##### Reporting:

- Modify logbook dead discard reporting for the Coastal Fisheries Logbook to ensure that information on shark interactions would be available;
- Request Atlantic, Gulf of Mexico, and Caribbean Fishery Management Councils that manage fisheries using longline and/or gillnet gear to place observers on vessels to monitor shark bycatch;

##### Seasons:

- No open seasons; and,

## Regions:

- No regions for sharks.

## *Recreational Management Measures*

- Recreational fisheries for sharks would be catch and release only with no possession allowed.

## **2.2 Other Alternatives Analyzed**

NMFS is also considering alternatives that would modify the existing schedule for conducting shark stock assessments and clarifying when the annual Stock Assessment SAFE report should be released. These alternatives are not analyzed within alternative suites.

### **2.2.1 Stock Assessment Frequency**

#### **Alternative 6: Stock Assessments for Sharks Every 2-3 Years (Status Quo)**

Alternative 6 would maintain current requirements to conduct stock assessments every 2-3 years. The 1999 Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks (1999 FMP) established that stock assessments be conducted for each species or species group every two to three years. HMS stock assessments are crucial in order to define stock boundaries, monitor rebuilding plans, improve knowledge of stock dynamics, and incorporate additional data in a timely manner. Since 2000, there have been two stock assessments completed by NMFS for LCS (2002, 2005/2006), and two assessments completed for SCS (May 2002 and 2007). Other assessments have been completed by other entities, including: SCS (August 2002 by Mote Marine Laboratory), two assessments for pelagic sharks (2004 by ICCAT), and the porbeagle assessment completed by the Canadian Department of Fisheries and Oceans (2005). The Agency is aware of another stock assessment being conducted by the Standing Committee on Research and Statistics (SCRS) of ICCAT for shortfin mako and blue sharks in 2008.

#### *Alternative 7: Stock Assessments for Sharks At Least Every 5 years - Preferred Alternative*

Alternative 7 would change the current process outlined in the 1999 FMP by requiring stock assessments for sharks at least every five years versus every 2-3 years. Stock assessments could occur more frequently, however, they must be conducted at least every five years. Because of the time necessary to modify management measures consistent with stock assessments, lengthening the amount of time between stock assessments would allow existing or forthcoming measures to attempt to achieve their stated objectives. In 2003, the Agency adopted the Southeast Data Assessment and Review (SEDAR) process for completing shark stock assessments at the request of industry, environmentalists, and academics. This process increases the time necessary to complete a stock assessment because it entails three week long workshops where data are reviewed, stock assessment models run, and results reviewed by an outside panel. Since the process to complete necessary assessments on a species complex can take up to a year, completing these assessments every 2-3 years is not practical. This alternative would not modify any stock assessments that are already scheduled, nor would it modify assessments conducted by

other management entities, or the frequency of stock assessments conducted for other HMS species.

### **2.2.2 SAFE Report Timing**

#### **Alternative 8: SAFE Report Published in January or February of Every Year (Status Quo)**

Alternative 8 would maintain the current process of publishing a SAFE report in January or February of each year. According to the 1999 FMP, each year in January or February, NMFS publishes one SAFE report for the Atlantic tunas, swordfish, billfish, and sharks. The SAFE report follows the guidelines specified in National Standard (NS) 2 and is used by NMFS to develop and evaluate regulatory adjustments under the framework procedure or the FMP amendment process. This information provides the basis for determining annual harvest levels from each stock, documenting significant trends or changes in the resource, bycatch, and the fishery over time, and assessing the relative success of existing state and Federal fishery management programs.

#### *Alternative 9: SAFE Report Published in the Fall of Every Year – Preferred Alternative*

Alternative 9 would modify the existing regulations by requiring the publication of a SAFE report in the fall of each year. The annual SAFE report would still be used to develop and evaluate regulatory adjustments under the framework procedure or the FMP amendment process as it is currently under the status quo, but it would be released to the public by the fall of each year.

## **2.3 Alternative Considered But Not Further Analyzed**

### **2.3.1 Shark Fishery for Directed, Incidental, HMS Angling, and HMS Charter/Headboat Permit Holders Only (No BLL Gear)**

This alternative would remove BLL gear from the HMS authorized gear list but would still allow a fishery for directed, incidental, HMS Angling, Atlantic tunas general category (if participating in a registered tournament), and HMS Charter/Headboat permit holders using other authorized gears, including: gillnet, handline, rod and reel, bandit gear, and PLL. Commercial shark permit holders would not be able to possess sharks with BLL gear on board. The alternative was considered but not further analyzed at this time because BLL gear is the primary gear used to harvest sharks. As such, in order to reduce shark mortality, the Agency considered not allowing BLL gear in the shark fishery. However, this gear type is also deployed in other fisheries to target other non-HMS species (snapper/grouper, reef fish, and tilefish). Selecting this alternative could result in excessive regulatory discards of sharks because vessels with commercial shark permits would have to discard all sharks landed incidentally in the pursuit of other non-HMS species when BLL gear is onboard. Further, the increased retention limits described in this alternative suite may encourage shark fishermen to increase effort significantly in the shark gillnet fishery which, depending on where this effort were concentrated, may increase bycatch and the likelihood of interactions with marine mammals, sea turtles, and smalltooth sawfish.

Not allowing BLL gear in the shark fishery would have significant economic and social impacts on commercial shark permit holders primarily using BLL gear. While it is assumed that few directed shark permit holders subsist entirely on revenues attained from the shark fishery, impacts would still be severe for those participants that depend on any income from participating in the directed shark fishery at certain times of the year. Because of the extensive economic impacts to shark directed permit holders as a result of not allowing BLL gear in the shark fishery, it is assumed that directed permit holders would likely pursue one of the following options as a result of closing the Atlantic shark fishery to BLL gear: (1) transfer fishing effort to other fisheries for which they are already permitted (snapper grouper, king and Spanish mackerel, tilefish, lobster, dolphin/wahoo, *etc.*), (2) acquire the necessary permits to participate in other fisheries (both open access and/or limited access fisheries), or (3) relinquish all permits and leave the fishing industry.

Specific management measures implemented via this alternative would include:

#### *Commercial Management Measures*

##### Quotas/Species Complexes:

- Base quota: Sandbar = 116.6 mt dw; non-sandbar LCS = 514.2 mt dw; SCS = 454 mt dw; Pelagic Sharks (Other than Blue and Porbeagle Sharks) = 488 mt dw; Blue Sharks = 273 mt dw; Porbeagle Sharks = Prohibited (0 mt dw quota); and Display and Scientific Research = 60 mt ww (Sandbar = 2.8 mt ww (2 mt dw)); all other shark species (except dusky sharks) = 57.2 mt ww (41.2 mt dw);
- Adjusted quota process: Overharvests would be removed from the next season's quota. Underharvests for species that are not unknown, overfished, or experiencing overfishing would be transferred to the next season's quota, up to 50 percent of the base quota. For species/complexes that are overfished, unknown, or experiencing overfishing; underharvests would not be transferred to the next season's quota;

##### Time/Area Closures:

- Revise existing BLL closures to reflect the fact that BLL is no longer an authorized gear in HMS fisheries;
- HMS time/area closures for other gear types and fisheries would still be in effect;

##### Retention Limits:

- 10 sandbar/vessel/trip and 48 non-sandbar LCS/vessel/trip for directed and incidental permit holders;
- No trip limit for SCS or pelagic sharks (except porbeagle sharks) for directed permit holders;
- 16 SCS and pelagic sharks (except porbeagle sharks) combined for incidental permit holders;
- Retention of porbeagle sharks would be prohibited in all fisheries;
- All sharks must be landed with all fins naturally attached;



Reporting:

- Dealer reports must be received by NMFS within 14 days;
- Other logbook and observer requirements would be maintained;
- All unclassified sharks reported would be categorized as sandbar sharks;

Seasons:

- One commercial season opens for all sharks on January 1 of each year;
- Retention of sandbar, non-sandbar LCS, SCS, and pelagic sharks (except porbeagle sharks) would be prohibited within 5 days of achieving 80 percent of their respective quotas; and,

Regions:

- One region for all managed shark species.

*Recreational Management Measures*

- Authorized species include LCS: nurse, tiger, lemon, great hammerhead, smooth hammerhead, and scalloped hammerhead; SCS: bonnethead and Atlantic sharpnose; pelagics: shortfin mako, common thresher, oceanic whitetip, and blue sharks; and,
- Possession limit: 1 >54" FL shark per vessel per trip, also 1 sharpnose and 1 bonnethead per person with no minimum size.

**Table 2.1**      **Overview of alternative suites**

<b>Alternative Suite</b>	<b>Quotas/Species Complexes</b>	<b>Time/Area Closures</b>	<b>Retention Limits</b>	<b>Reporting</b>	<b>Seasons</b>	<b>Regions</b>	<b>Recreational Measures</b>
1 – Status Quo	<ul style="list-style-type: none"> <li>- 1,017 mt dw LCS</li> <li>- 454 mt dw SCS</li> <li>- 488 mt dw Pelagic Sharks (other than Blue and Porbeagle)</li> <li>- 273 mt dw Blue Sharks</li> <li>- 92 mt dw Porbeagle Sharks</li> <li>- 60 mt ww for EFPs</li> <li>- 19 Prohibited spp.</li> </ul>	Mid-Atlantic (BLL), Caribbean (BLL), Right Whale (GN) restrictions, PLL closures	<ul style="list-style-type: none"> <li>- Directed permit holders: 4,000 lb dw LCS; no trip limit for Pelagics/SCS</li> <li>- Incidental permit holders: 5 LCS and 16 Pelagics/SCS combined</li> </ul>	- Dealer weigh-out slips, logbooks, observers	- Trimesters	<ul style="list-style-type: none"> <li>- 3 Regions for LCS and SCS</li> <li>- no Regions for Pelagics</li> </ul>	1 shark > 54” FL vessel/trip, plus 1 sharpnose and 1 bonnethead per person/trip (no minimum size)

Alternative Suite	Quotas/Species Complexes	Time/Area Closures	Retention Limits	Reporting	Seasons	Regions	Recreational Measures
2 – Limited Shark Fishery for Directed Permit Holders Only	<ul style="list-style-type: none"> <li>- 116.6 mt dw Sandbar sharks</li> <li>- 541.2 mt dw non-sandbar LCS</li> <li>- SQ SCS</li> <li>- SQ Pelagic Sharks (other than Blue and Porbeagle)</li> <li>- SQ Blue Sharks</li> <li>- Add porbeagle sharks to Prohibited spp.</li> <li>- 60 mt ww for EFPs (includes sub-quota of 2.8 mt ww (2 mt dw) for Sandbar sharks; all other shark spp. (except dusky sharks) 57.2 mt ww (41.2 mt dw))</li> <li>- No dusky sharks authorized for display</li> <li>- Remove overharvests from next season</li> <li>- Carryover up to 50 percent of base quota for spp. not overfished (<i>i.e.</i>, SCS)</li> <li>- No carryover for overfished, overfishing, or unknown spp. (<i>e.g.</i>, LCS)</li> </ul>	<ul style="list-style-type: none"> <li>- SQ + SAFMC's closures</li> </ul>	<ul style="list-style-type: none"> <li>- Directed permit holders: 8 Sandbar sharks/vessel/trip; 21 non-sandbar LCS/vessel/trip</li> <li>- SCS/Pelagics no trip limit</li> <li>- Incidental permit holders: no shark retention</li> <li>- No Sandbar sharks with PLL onboard</li> <li>- Porbeagle prohibited</li> <li>- All sharks landed with all fins naturally attached</li> </ul>	<ul style="list-style-type: none"> <li>- Increase dealer reporting frequency to <i>received</i> within 24 hrs from time of sale</li> <li>- Logbooks/Observers SQ</li> <li>- Unclassified sharks = add to Sandbar shark quota</li> </ul>	<ul style="list-style-type: none"> <li>- Open Jan. 1</li> <li>- Close both Sandbar and non-sandbar LCS when either @ 80% of quota</li> <li>- SCS and pelagic sharks close @ 80% of quota</li> <li>- 5 days notice</li> </ul>	1 Region	<ul style="list-style-type: none"> <li>- SQ retention and size limit</li> <li>- Possession of: LCS: nurse, tiger, lemon, and hammerheads; SCS: bonnethead and Atlantic sharpnose,; Pelagics: shortfin mako, common thresher, oceanic whitetip, and blue sharks ONLY</li> </ul>

Alternative Suite	Quotas/Species Complexes	Time/Area Closures	Retention Limits	Reporting	Seasons	Regions	Recreational Measures
3 – Limited Shark Fishery for Directed and Incidental Permit Holders (all gears)	Same as Alt 2	Same as Alt 2	<ul style="list-style-type: none"> <li>- Directed and Incidental permit holders: 4 Sandbar sharks /vessel/trip; 10 non-sandbar LCS/vessel/trip (~499 lb dw/trip for Sandbar and non-sandbar LCS combined)</li> <li>- Directed permit holders: no trip limit for SCS/Pelagic sharks</li> <li>- Incidental permit holders: 16/vessel/trip for SCS/Pelagic sharks (combined)</li> <li>- Porbeagle prohibited</li> <li>- All sharks landed with all fins naturally attached</li> <li>- All gears allowed</li> </ul>	<ul style="list-style-type: none"> <li>- Dealer reports <i>received</i> within 10 days</li> <li>- Logbooks/Observers SQ</li> <li>- Unclassified sharks = added to Sandbar quota</li> </ul>	Same as Alt 2	Same as Alt 2	Same as Alt 2

Alternative Suite	Quotas/Species Complexes	Time/Area Closures	Retention Limits	Reporting	Seasons	Regions	Recreational Measures
4 - <i>Research set aside; allows for very small directed fishery for LCS – Preferred Alternative Suite</i>	<ul style="list-style-type: none"> <li>- 116.6 mt dw Sandbar shark base quota; 50 mt dw non-sandbar LCS quota for research fishery</li> <li>- 87.9 mt dw sandbar shark adjusted quota; 37.5 mt dw non-sandbar LCS quota for research fishery (2008-2012)</li> <li>- Non-sandbar base quotas outside of research fishery: 439.5 mt dw for the Gulf of Mexico region; 188.3 mt dw for the Atlantic region</li> <li>- Non-sandbar adjusted quotas outside of research fishery: 390.5 mt dw for the Gulf of Mexico region; 187.8 mt dw for the Atlantic region (2008-2012)</li> <li>- 454 mt dw SCS</li> <li>- 488 mt dw Pelagics (other than Blue and Porbeagle)</li> <li>- 273 mt dw Blue</li> <li>- 1.7 mt dw Porbeagle Sharks Quota</li> <li>- 60 mt ww for EFPs (includes sub-quota of 2.8 mt ww (2 mt dw) for Sandbar sharks; all other shark spp. (except dusky sharks) 57.2 mt ww (41.2 mt dw))</li> </ul>	Same as Alt 2	<ul style="list-style-type: none"> <li>- Sandbar retention allowed ONLY by vessels with shark research permit</li> <li>- Sandbar/non-sandbar LCS retention depends upon research objectives</li> <li>- Base quota: 36 non-sandbar LCS/vessel/trip for directed permit holders; 3 non-sandbar LCS/vessel/trip for incidental permit holders</li> <li>- Adjusted quota: 33 non-sandbar LCS/vessel/trip for directed permit holders; 3 non-sandbar LCS/vessel/trip for incidental permit holders (2008- 2012)</li> <li>- Directed permit holders: no trip limit for SCS/Pelagic sharks</li> <li>- Incidental permit holders: 16/vessel/trip SCS/Pelagic sharks (combined)</li> <li>- All sharks landed with all fins naturally attached</li> </ul>	<ul style="list-style-type: none"> <li>- Dealer reports <i>received</i> within 10 days</li> <li>- 100% observer coverage on research vessels</li> <li>-Logbooks/Observers SQ</li> <li>- Unclassified shark species proportioned out among sandbar, non-sandbar LCS, SCS, and Pelagic shark quotas based on dealer reports and/or observer reports from outside research fishery</li> </ul>	<ul style="list-style-type: none"> <li>- Open Jan. 1</li> <li>- Close Sandbar, non-sandbar LCS, SCS, and Pelagics when landings of each species/complex @ 80% of quota</li> <li>- 5 days notice</li> </ul>	2 Regions: Atlantic and Gulf of Mexico for non-sandbar LCS; one region for sandbar sharks, SCS, and pelagic sharks	<ul style="list-style-type: none"> <li>- SQ retention and size limit</li> <li>- Recreational fishermen can land tiger sharks and non-ridgeback LCS (LCS: blacktip, spinner, bull, lemon, nurse, hammerheads, and tiger sharks; SCS: bonnethead, Atlantic sharpnose, finetooth, and blacknose sharks; Pelagics: shortfin mako, common thresher, oceanic whitetip, blue, and porbeagle sharks)</li> </ul>

<b>Alternative Suite</b>	<b>Quotas/Species Complexes</b>	<b>Time/Area Closures</b>	<b>Retention Limits</b>	<b>Reporting</b>	<b>Seasons</b>	<b>Regions</b>	<b>Recreational Measures</b>
5 – Close Atlantic Shark Fishery	All species prohibited	NA	None, all species prohibited	<ul style="list-style-type: none"> <li>- Improve logbook dead discard reporting for Coastal Fisheries Logbook</li> <li>- Request observers on other vessels to monitor shark bycatch in other fisheries</li> </ul>	NA	NA	No possession of any sharks, catch and release only